

U.S. DEPARTMENT OF COMMERCE  
PATENT AND TRADEMARK OFFICE

ATTORNEY DOCKET NO.

## TRANSMITTAL LETTER TO THE UNITED STATES

401489/YPLEE

## DESIGNATED/ELECTED OFFICE (DO/EO/US)

U.S. APPLICATION NO.

## CONCERNING A FILING UNDER 35 USC 371 AND 37 CFR 1.491

10/009781

INTERNATIONAL APPLICATION NO.  
PCT/KR00/00533INTERNATIONAL FILING DATE  
May 25, 2000PRIORITY DATE CLAIMED  
December 27, 1999

## TITLE OF INVENTION

Subtitle Management Method For Digital Video Disk

## APPLICANT(S) FOR DO/EO/US


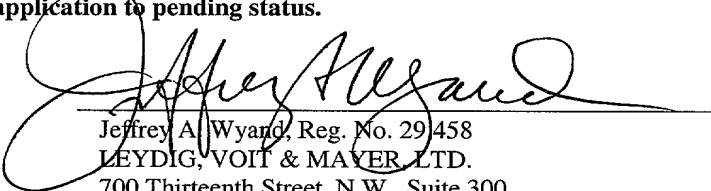
Jong-won CHO

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 USC 371 and 37 CFR 1.491.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 USC 371 and 37 CFR 1.491.
3. ☒ This is an express request to begin national examination procedures (35 USC 371(f)).
4. ☒ The US has been elected by the expiration of 19 months from the priority date (PCT Article 31).
5. ☒ A copy of the International Application as filed (35 USC 371(c)(2))
  - a. ☐ is attached hereto (required only if not communicated by the International Bureau).
  - b. ☒ has been communicated by the International Bureau.
  - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ An English language translation of the International Application as filed (35 USC 371(c)(2)).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 USC 371(c)(3))
  - a. ☐ are attached hereto (required only if not communicated by the International Bureau).
  - b. ☐ have been communicated by the International Bureau.
  - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
  - d. ☒ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 USC 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 USC 371(c)(4)).
10. ☐ An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 USC 371(c)(5)).
11. Nucleotide and/or Amino Acid Sequence Submission
  - a. ☐ Computer Readable Form (CRF)
  - b. Specification Sequence Listing on:
    - i. ☐ CD-ROM or CD-R (2 copies); or
    - ii. ☐ Paper Copy
  - c. ☐ Statement verifying identity of above copies

## Items 12 to 19 below concern other document(s) or information included:

12. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
  - ☐ Form PTO-1449
  - ☐ Copies of Listed Documents
13. ☒ An assignment for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
14. ☒ A FIRST preliminary amendment.
  - ☐ A SECOND or SUBSEQUENT preliminary amendment.
15. ☐ A substitute specification.
16. ☐ A change of power of attorney and/or address letter.
17. ☒ Application Data Sheet Under 37 CFR 1.76
18. ☒ Return Receipt Postcard
19. ☒ Other items or information: Drawings (5 sheets)

U.S. APPLICATION NO. <b>10/009781</b>		INTERNATIONAL APPLICATION NO. PCT/KR00/00533		ATTORNEY DOCKET NO. 401489	
20. <input checked="" type="checkbox"/> The following fees are submitted:				CALCULATIONS	PTO USE ONLY
<b>Basic National Fee (37 CFR 1.492(a)(1)-(5)):</b> Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO..... \$1,040.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO..... \$890.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO, but international search fee (37 CFR 1.445(a)(2)) paid to USPTO..... \$740.00 International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4)..... \$710.00 International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1) to (4)..... \$100.00					
ENTER APPROPRIATE BASIC FEE AMOUNT=				\$1,040.00	
Surcharge of \$130.00 for furnishing the National fee or oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date				\$	
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total Claims	6 -20=		x \$ 18.00	\$	
Independent Claims	1 - 3 =		x \$ 84.00	\$	
<input type="checkbox"/> Multiple Dependent Claim(s) (if applicable)			+\$280.00	\$	
TOTAL OF ABOVE CALCULATIONS=				\$1,040.00	
<input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.				\$520.00	
SUBTOTAL=				\$520.00	
Processing fee of \$130.00 for furnishing English Translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date.				\$	
TOTAL NATIONAL FEE=				\$520.00	
Fee for recording the enclosed assignment. The assignment must be accompanied by an appropriate cover sheet. \$40.00 per property				\$	
TOTAL FEE ENCLOSED=				\$560.00	
				Amount to be:	
				refunded	\$
				charged:	\$
a. <input checked="" type="checkbox"/> A check in the amount of \$560.00 to cover the above fee is enclosed. b. <input type="checkbox"/> Please charge Deposit Account No. 12-1216 in the amount of \$ to cover the above fees. A duplicate copy of this sheet is enclosed. c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 12-1216. A duplicate copy of this sheet is enclosed.					
<b>NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.</b>					
SEND ALL CORRESPONDENCE TO:					
 <b>23548</b> PATENT TRADEMARK OFFICE		 Jeffrey A. Wyand, Reg. No. 29458 LEYDIG, VOIT & MAYER LTD. 700 Thirteenth Street, N.W., Suite 300 Washington, DC 20005-3960 (202) 737-6770 (telephone) (202) 737-6776 (facsimile)			
		Date: <u>Dec 17, 2001</u>			

10/009781

PATENT

Attorney Docket No. 401489/Lee

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:

JONG-WON CHO

Application No. Unassigned

Art Unit: Unassigned

Filed: December 17, 2001

Examiner: Unassigned

For: SUBTITLE MANAGE-  
MENT METHOD FOR  
DIGITAL VIDEO DISC

**PRELIMINARY AMENDMENT**

Commissioner for Patents  
Washington, D. C. 20231

Dear Sir:

Prior to the examination of the above-identified patent application, please enter the following amendments and consider the following remarks.

*IN THE CLAIMS:*

*Replace the indicated claims with:*

1. (Amended) A method of captioning a digital video disk (DVD), comprising:
  - (a) loading a prepared caption script in a first language into a caption indicator;
  - (b) showing a moving picture corresponding to the caption script and ascertaining caption generation and caption annihilation points of the moving picture;

(c) writing time codes corresponding to the caption generation point and the caption ending point and displaying a list of caption scripts and a list of time codes on the caption indicator;

(d) checking state of the time codes and state of a corresponding caption displayed, and correcting the state of the time codes and the state of the corresponding caption displayed if an error is detected; and

(e) producing the caption scripts and the time codes in a script file

2. (Amended) The method of claim 1, wherein, if it is determined that there is a caption script in a second language, loading the caption script of the second language in the caption indicator between the steps (a) and (b).

3. (Amended) The method of claim 1, wherein the step (b) is performed by a manual key input, and, if the ascertaining of the caption generation point and caption annihilation point of the corresponding caption corresponding to the moving picture is erroneous, ascertaining the caption generation point and caption annihilation point of the caption preceding the corresponding caption.

4. (Amended) The method of claim 1, wherein, in step (c), the time codes are obtained by ascertaining number of moving picture frames at the caption generation point and caption annihilation point of the corresponding caption, and displaying each of the caption scripts simultaneously with the caption generation point and the caption annihilation point of the caption script.

5. (Amended) The method of claim 1, wherein the state of the time codes in step (d) includes whether the time codes match with the caption generation point and the caption annihilation point and whether each of the time codes is duplicated, and, if an error is detected, the step (d) comprises identifying and selecting the time codes of the corresponding caption from a list of caption subscripts and time codes and correcting inconsistency between the time codes and the caption generation point and caption annihilation point, duplication of the time codes, or the state of the corresponding caption displayed while showing a moving picture corresponding to the selected time codes.

6. (Amended) The method of claim 1, further comprising, after the step (e):  
determining whether there is a caption script in a second language and, if so,  
producing a script file of the caption script of the second language using the time codes of  
the former script file; and  
storing the script file produced if there are no caption scripts in different  
languages.

*IN THE ABSTRACT*

*Replace the abstract with:*

**Abstract of the Invention**

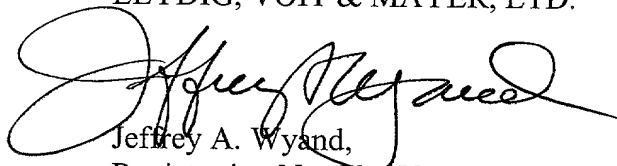
A method of processing a caption for a digital video disk (DVD), by which a script file is produced by extracting an exact time code of the caption generation point and caption annihilation point of a moving picture, and a script file of caption scripts of several languages is produced using the former script file, so that captions in several languages can be written within a single moving picture running time. Therefore, the operation time and cost for captioning can be reduced, and the exact caption generation point and the exact caption annihilation point can be recorded without errors just by a simple key input, so that rapid and efficient captioning is achieved. This method includes loading a prepared caption script of a predetermined language in a caption indicator, showing a moving picture corresponding to the caption script and ascertaining the caption generation point and caption annihilation point of the shown moving picture, writing time codes corresponding to the caption generation point and the caption annihilation point and displaying a list of caption scripts and a list of time codes on the caption indicator, checking the state of the time codes and the state of a corresponding caption displayed, and correcting the state of the time codes and the state of the corresponding caption displayed if an error is detected, and producing the caption scripts and the time codes in a script file.

**REMARKS**

The foregoing amendments are made to correct minor translational errors and to meet United States requirements as to form. No new matter is added.

Respectfully submitted,

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Date: December 17, 2001  
JAW:cmcg

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:

JONG-WON CHO

Application No.	Unassigned	Art Unit:	Unassigned
Filed:	December 17, 2001	Examiner:	Unassigned
For:	SUBTITLE MANAGE- MENT METHOD FOR DIGITAL VIDEO DISC		

**AMENDMENTS TO SPECIFICATION, CLAIMS, AND  
ABSTRACT MADE VIA PRELIMINARY AMENDMENT**

*Amendments to existing claims:*

1. (Amended) A method of captioning a digital video disk (DVD), comprising:
  - (a) loading a prepared caption script ~~of in a predetermined first language in~~ into a caption indicator;
  - (b) showing a moving picture corresponding to the caption script and ascertaining ~~the caption generation point and caption ending point~~ annihilation points of the ~~shown~~ moving picture;
  - (c) writing time codes corresponding to the caption generation point and the caption ending point and displaying a list of caption scripts and a list of time codes on the caption indicator;
  - (d) checking ~~the~~ state of the time codes and ~~the~~ state of a corresponding caption displayed, and correcting the state of the time codes and the state of the corresponding caption displayed if ~~something wrong~~ an error is detected; and
  - (e) producing the caption scripts and the time codes ~~into~~ in a script file

2. (Amended) The method of claim 1, wherein, if it is determined that there is a caption script of in a different second language, ~~further comprising~~ loading the caption script of ~~a different~~ the second language in the caption indicator between the steps (a) and (b).

3. (Amended) The method of claim 1, wherein the step (b) is performed by a manual key input, and, if the ~~ascertainment~~ ascertaining of the caption generation point and caption annihilation point of the corresponding caption corresponding to the moving picture is ~~improper~~ erroneous, ascertaining the caption generation point and caption annihilation point of the caption preceding the corresponding caption ~~are ascertained~~.

4. (Amended) The method of claim 1, wherein, in step (c), the time codes are obtained by ~~ascertaining~~ the number of moving picture frames at the caption generation point and caption annihilation point of the corresponding caption, and displaying each of the caption scripts ~~is displayed simultaneously together~~ with the caption generation point and the caption annihilation point of the caption script.

5. (Amended) The method of claim 1, wherein the state of the time-code state codes in step (d) includes whether the time codes match with the caption generation point and the caption annihilation point and whether each of the time codes is duplicated, and, if ~~something wrong~~ an error is detected, the step (d) comprises identifying and selecting the time codes of the corresponding caption from a list of ~~the~~ caption subscripts and time codes and correcting ~~the~~ inconsistency between the time codes and the caption generation point and caption annihilation point, duplication of the time codes, or the ~~poor~~ state of the corresponding caption displayed while showing a moving picture corresponding to the selected time codes.

6. (Amended) The method of claim 1, further comprising, after the step (e):  
determining whether there is a caption script of in a different second language and, if ~~there is a caption script of a different language~~ so, producing a script file of the caption script of ~~a different~~ the second language using the ~~time-code~~ codes of the former script file; and



storing the ~~produced~~ script file produced if there are no caption scripts ~~of~~ in different languages.

*Amendments to the abstract:*

### Abstract of the Invention

A method of processing a caption for a digital video disk (DVD), by which a script file is produced by extracting an exact time code of the caption generation point and caption annihilation point of a moving picture, and a script file of caption scripts of ~~a plurality of several~~ languages is produced using the former script file, so that captions ~~of a plurality of~~ in several languages can be written within a single moving picture running time. Therefore, the operation time and cost for captioning can be reduced, and the exact caption generation point and the exact caption annihilation point can be recorded without errors just by a simple key input, so that rapid and efficient captioning is achieved. This method includes ~~the step (200) of loading a prepared caption script of a predetermined language in a caption indicator, the step (300) of showing a moving picture corresponding to the caption script and ascertaining the caption generation point and caption-ending annihilation point of the shown moving picture, the step (400) of writing time codes corresponding to the caption generation point and the caption-ending annihilation point and displaying a list of caption scripts and a list of time codes on the caption indicator, the step (500) of checking the state of the time codes and the state of a corresponding caption displayed, and correcting the state of the time codes and the state of the corresponding caption displayed if something wrong an error is detected, and the step (600) of producing the caption scripts and the time codes~~ into in a script file.

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:

JONG-WON CHO

Application No.	Unassigned	Art Unit:	Unassigned
Filed:	December 17, 2001	Examiner:	Unassigned
For:	SUBTITLE MANAGE- MENT METHOD FOR DIGITAL VIDEO DISC		

**PENDING CLAIMS AFTER ENTRY OF PRELIMINARY AMENDMENT**

1. A method of captioning a digital video disk (DVD), comprising:
  - (a) loading a prepared caption script in a first language into a caption indicator;
  - (b) showing a moving picture corresponding to the caption script and ascertaining caption generation and caption annihilation points of the moving picture;
  - (c) writing time codes corresponding to the caption generation point and the caption ending point and displaying a list of caption scripts and a list of time codes on the caption indicator;
  - (d) checking state of the time codes and state of a corresponding caption displayed, and correcting the state of the time codes and the state of the corresponding caption displayed if an error is detected; and
  - (e) producing the caption scripts and the time codes in a script file
2. The method of claim 1, wherein, if it is determined that there is a caption script in a second language, loading the caption script of the second language in the caption indicator between the steps (a) and (b).

3. The method of claim 1, wherein the step (b) is performed by a manual key input, and, if the ascertaining of the caption generation point and caption annihilation point of the corresponding caption corresponding to the moving picture is erroneous, ascertaining the caption generation point and caption annihilation point of the caption preceding the corresponding caption.

4. The method of claim 1, wherein, in step (c), the time codes are obtained by ascertaining number of moving picture frames at the caption generation point and caption annihilation point of the corresponding caption, and displaying each of the caption scripts simultaneously with the caption generation point and the caption annihilation point of the caption script.

5. The method of claim 1, wherein the state of the time codes in step (d) includes whether the time codes match with the caption generation point and the caption annihilation point and whether each of the time codes is duplicated, and, if an error is detected, the step (d) comprises identifying and selecting the time codes of the corresponding caption from a list of caption subscripts and time codes and correcting inconsistency between the time codes and the caption generation point and caption annihilation point, duplication of the time codes, or the state of the corresponding caption displayed while showing a moving picture corresponding to the selected time codes.

6. The method of claim 1, further comprising, after the step (e):  
determining whether there is a caption script in a second language and, if so, producing a script file of the caption script of the second language using the time codes of the former script file; and  
storing the script file produced if there are no caption scripts in different languages.

SUBTITLE MANAGEMENT METHOD FOR DIGITAL VIDEO DISKBACKGROUND OF THE INVENTION

## 5 1. Field of the Invention

The present invention relates to a method of processing a caption of a digital video disk, and more particularly, to a method of processing a caption of a digital video disk, by which a plurality of language captions are written within a single moving picture running time using a point in  
10 time when the caption of a moving picture is generated and a point in time when the caption of the moving picture is ended.

## 2. Description of the Related Art

General digital video disks (DVDs) are storage media which can store a variety of digital information such as video information and audio  
15 information. In particular, DVD movies have the convenience and various functions that cannot be found in existing storage media. Among captions used in DVDs, captions that are used for people who have difficulty in hearing or for the purpose of learning can be produced in a maximum of 32 different languages and inserted, so that a user can  
20 easily select and watch a desired language in a movie.

FIG. 1 illustrates the entire process for producing a DVD film. Referring to FIG. 1, in the first stage, there is a film selection step 1 in which a film to be produced as a DVD title is selected among released films or to-be-released films. The second stage includes a video data  
25 encoding step 2, an acoustic data encoding step 3 and a sub-picture producing step 4. In the video data encoding step 2, the master of the selected film is encoded in an MPEG-2 file format suitable for a DVD manufacturing format through a telecine operation. In the acoustic data encoding step 3, the format of a multi-channel sound in the selected film  
30 is converted into a format suitable for a DVD acoustic format, for example, AC-3. Multilingual audio support which covers a maximum of 8 languages is carried out in the step 3. The sub-picture producing step 4 is for performing a menu function and processing a caption on a DVD. Moving pictures and still pictures can be used on a menu, and

multilingual captioning can cover a maximum of 32 languages. The third stage includes a DVD authoring step 5 in which a picture, a sound, a menu and a caption are united and an area code, a copying prevention code and the like are added to the united result to thereby form a stream.

- 5 The fourth stage includes a step 6 in which the thus-formed stream is stored in a large-capacity storage medium such as a digital layer tape (DLT) or a DVD-ROM.

FIG. 2 is a flowchart for illustrating a conventional DVD caption producing process. Referring to FIG. 2, a time code is extracted from a movie picture 11 to be produced for DVDs, using a text file 10 of a primitive multilingual caption, in step 12. A caption corresponding to each language is inserted according to an extracted time code, in step 13, while the caption is produced in the format of a graphic file BMP or a text file, so that a graphic file BMP or text file are adjusted corresponding to the time code. Then, the caption corresponding to each language undergoes a timing inspection for determining whether a caption generation point and a caption concluding point are proper and undergoes correction, in step 14. A primitive file into which a time code has been completely inserted is converted into a script dedicated file, in step 15. Thereafter, the script file is finally input to a DVD authoring program 16.

In a conventional DVD caption producing process as described with reference to FIG. 2, a caption for DVD films is produced and inserted in the format of a graphic file or text file in an authoring process. Also, generation of a time code for designating a caption generation point and a caption ending point is complicated and time-consuming in the case of moving pictures which require a two-hour running time on the average and no less than 1500 times of captions for movie speech. Therefore, in case that a caption is inserted in a plurality of languages, a caption corresponding to each of the languages must be inserted, so that additional working time and costs depending on the number of languages added are required.

## SUMMARY OF THE INVENTION

To solve the above-described problems, it is an object of the present invention to provide To solve the above problem, an objective of the present invention is to provide a method of processing a caption for a digital video disk (DVD), by which a script file is produced by extracting the exact number of image frames and an exact time code of the caption generation point and caption annihilation point of a moving picture, and a script file of caption scripts of a plurality of languages is produced using the formerly-produced script file, so that captions of a plurality of languages can be written within a single moving picture running time. Therefore, the operation time and cost for captioning can be reduced, and the exact caption generation point and the exact caption annihilation point can be recorded without errors just by a simple key input, so that rapid and efficient captioning is achieved.

To achieve the above objectives, the present invention provides a method of captioning a DVD, including: (a) loading a prepared caption script of a predetermined language in a caption indicator; (b) showing a moving picture corresponding to the caption script and ascertaining the caption generation point and caption ending point of the shown moving picture; (c) writing time codes corresponding to the caption generation point and the caption ending point and displaying a list of caption scripts and a list of time codes on the caption indicator; (d) checking the state of the time codes and the state of a corresponding caption displayed, and correcting the state of the time codes and the state of the corresponding caption displayed if something wrong is detected; and (e) producing the caption scripts and the time codes into a script file.

If it is determined that there is a caption script of a different language, loading the caption script of a different language in the caption indicator is further included between the steps (a) and (b). The step (b) is performed by a manual key input, and, if the ascertainment of the caption generation point and caption annihilation point of the corresponding caption corresponding to the moving picture is improper, the caption generation point and caption annihilation point of the caption preceding the corresponding caption are ascertained. In step (c), the

time codes are obtained by ascertaining the number of moving picture frames at the caption generation point and caption annihilation point of the corresponding caption, and each of the caption scripts is displayed simultaneously together with the caption generation point and the caption annihilation point of the caption script. The time code state in step (d) includes whether the time codes match with the caption generation point and the caption annihilation point and whether each of the time codes is duplicated, and, if something wrong is detected, the step (d) comprises identifying and selecting the time codes of the corresponding caption from a list of the caption subscripts and time codes and correcting the inconsistency between the time codes and the caption generation point and caption annihilation point, duplication of the time codes, or the poor state of the corresponding caption displayed while showing a moving picture corresponding to the selected time codes. After the step (e), a determination is made as to whether there is a caption script of a different language. If there is a caption script of a different language, a script file of the caption script of a different language is produced using the time code of the former script file. If there are no caption scripts of different languages, the produced script file is stored.

According to the present invention, a script file is produced on the basis of an exact time code, and a script file of caption scripts of a plurality of languages is produced using the former script file, so that captions of a plurality of languages can be written within a single moving picture running time. Therefore, the operation time and cost for captioning can be reduced

#### BRIEF DESCRIPTION OF THE DRAWINGS

The above objects and advantages of the present invention will become more apparent by describing in detail preferred embodiments thereof with reference to the attached drawings in which:

FIG. 1 is a conceptual diagram illustrating a process for manufacturing a general digital video disk (DVD);

FIG. 2 is a flowchart illustrating a conventional DVD caption producing process;

FIG. 3 is a flowchart illustrating a DVD caption processing method according to the present invention; and

FIG. 4 is a flowchart illustrating an embodiment of a DVD caption processing method according to the present invention.

5

#### DETAILED DESCRIPTION OF THE INVENTION

Referring to FIG. 3, first, a prepared caption script is input to and loaded in a caption indicator, in step 200. Next, a moving picture corresponding to the caption script is shown, and a caption generation point and a caption ending point are ascertained from the shown moving picture, in step 300. Then, time codes corresponding to the caption generation point and the caption ending point are written, and a list of caption scripts and a list of time codes are displayed on the caption indicator, in step 400. Thereafter, a determination is made as to whether the time codes matches with the caption generation point and the caption ending point, and a correction is made on the time codes, in step 500. Then, the caption scripts and the time codes are produced into a script file, in step 600.



FIG. 4 is a flowchart illustrating an embodiment of a DVD caption processing method according to the present invention. Referring to FIG. 4, a caption script is input to and loaded in a caption indicator, in step 210. A determination is made as to whether there is a caption script of a different language, in step 220. If there is a caption script of a different language, this caption script is loaded in the caption indicator. If there are no caption scripts of different languages, a moving picture corresponding to the input caption script is shown, in step 230. A point when the caption of the shown moving picture is generated and a point when the caption of the shown moving picture ends are determined in steps 305 and 319, respectively. The determined caption generation point and the determined caption ending point are checked by a manual key input in steps 310 and 320, respectively. If it is determined in step 330 that the check of the points when a corresponding caption is generated and ends is improper, a caption prior to the corresponding caption is again checked as to the caption generation point and the caption ending point. Time codes corresponding to the caption generation point and the caption ending point are written in steps 315 and 325, respectively, and a list of caption scripts and a list of time codes are displayed on the caption indicator, in step 410. Here, the time codes are obtained from a moving picture frame corresponding to the caption generation point and a moving picture frame corresponding to the caption ending point. In step 410, individual caption scripts and the caption generation point and caption ending point of the individual caption scripts are simultaneously displayed. A determination is made as to whether each of the time codes matches with the caption generation point and the caption ending point, in step 510. The step 510 includes a process for detecting duplication of time codes and checking the state of a caption displayed. If there is a time code which does not match with its corresponding caption generation point and caption ending point and is duplicated and the state of a caption displayed is bad, the time code is selected after being confirmed from the list of caption scripts and time codes displayed in step 410. A moving picture corresponding to the selected time code is shown in step 520,

and simultaneously the inconsistency between the time code and its caption generation point and caption ending point, duplication of the time code, and the poor state of a caption displayed are corrected in step 530. The caption script and the time code are produced into a script file, in  
5 step 610. A determination is made as to whether there is a caption script of another language in the script file generation step, in step 620. If there is a caption script of another language, a script file of the caption script of the different language is produced using a time code corresponding to the different language caption script. If there are no  
10 caption scripts of different languages, the produced script file is completed, in step 630.

That is, caption scripts written by languages are loaded in a caption indicator, and a DVD moving picture captured by a high-performance capture board having no frame drops is shown. A  
15 user generates a signal relating to a caption generation point and a caption annihilation point of caption data loaded in a list indicator on which caption scripts are sequentially displayed, using a keyboard while viewing a moving picture. After the input made by a user by means of a keyboard, a frame corresponding to the caption generation point and the  
20 caption annihilation point is identified and converted into a time code, whereby the caption generation point and the caption annihilation point are recorded on the list indicator. In contrast with a conventional caption processing method of manually writing time codes while scanning their corresponding moving pictures one by one, in the present invention,  
25 an exact caption generation point and an exact caption annihilation point can be recorded without errors just by a simple keyboard manipulation, and time codes for a plurality of captions can be produced by a single operation. Thus, captioning requires only as much period of time as the running time of a moving picture, so that captioning is rapid and efficient.  
30 The lip sync of a moving picture and a caption can be precisely adjusted by a time shift function of shifting the time of the entire caption and a time code ratio adjusting function by which an individual caption can be extended or shrunk at a predetermined ratio. Also, the operation of a script file can be improved by a wide range of option of a style of

handwriting such as the size of a caption, the font type of caption, and the like.

In a method of captioning a digital video disk (DVD) according to the present invention as described above, a script file is produced by  
5 extracting an exact time code of the caption generation point and caption annihilation point of a moving picture, and a script file of caption scripts of a plurality of languages is produced using the former script file. This enables to write captions of a plurality of languages within a single moving picture running time, thereby reducing the operation time for  
10 captioning up to 1/10 to 1/30 compared to a conventional captioning method. Therefore, this method can be simply performed at low costs, and thus is economical. Also, in this method, the exact caption generation point and the exact caption annihilation point can be recorded without errors just by a simple key input, so that rapid and efficient  
15 captioning is achieved.

What is claimed is:

1. A method of captioning a digital video disk (DVD),  
comprising:

(a) loading a prepared caption script of a predetermined language  
5 in a caption indicator;

(b) showing a moving picture corresponding to the caption script  
and ascertaining the caption generation point and caption ending point of  
the shown moving picture;

(c) writing time codes corresponding to the caption generation  
10 point and the caption ending point and displaying a list of caption scripts  
and a list of time codes on the caption indicator;

(d) checking the state of the time codes and the state of a  
corresponding caption displayed, and correcting the state of the time  
codes and the state of the corresponding caption displayed if something  
15 wrong is detected; and

(e) producing the caption scripts and the time codes into a script  
file

2. The method of claim 1, if it is determined that there is a  
20 caption script of a different language, further comprising loading the  
caption script of a different language in the caption indicator between the  
steps (a) and (b).

3. The method of claim 1, wherein the step (b) is performed by  
25 a manual key input, and, if the ascertainment of the caption generation  
point and caption annihilation point of the corresponding caption  
corresponding to the moving picture is improper, the caption generation  
point and caption annihilation point of the caption preceding the  
corresponding caption are ascertained.

4, The method of claim 1, wherein, in step (c), the time codes  
are obtained by ascertaining the number of moving picture frames at the  
caption generation point and caption annihilation point of the  
corresponding caption, and each of the caption scripts is displayed

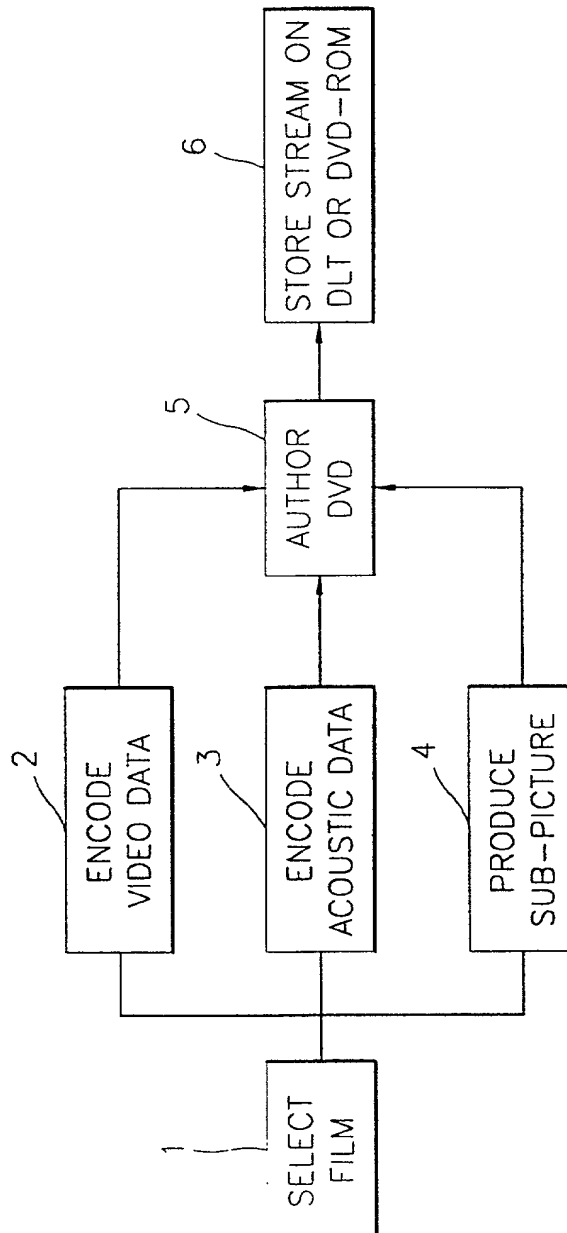
simultaneously together with the caption generation point and the caption annihilation point of the caption script.

5. The method of claim 1, wherein the time code state in step  
5 (d) includes whether the time codes match with the caption generation point and the caption annihilation point and whether each of the time codes is duplicated, and, if something wrong is detected, the step (d) comprises identifying and selecting the time codes of the corresponding caption from a list of the caption subscripts and time codes and  
10 correcting the inconsistency between the time codes and the caption generation point and caption annihilation point, duplication of the time codes, or the poor state of the corresponding caption displayed while showing a moving picture corresponding to the selected time codes.

15 6. The method of claim 1, after the step (e), further comprising:  
determining whether there is a caption script of a different language and, if there is a caption script of a different language, producing a script file of the caption script of a different language using  
20 the time code of the former script file; and  
storing the produced script file if there are no caption scripts of different languages.

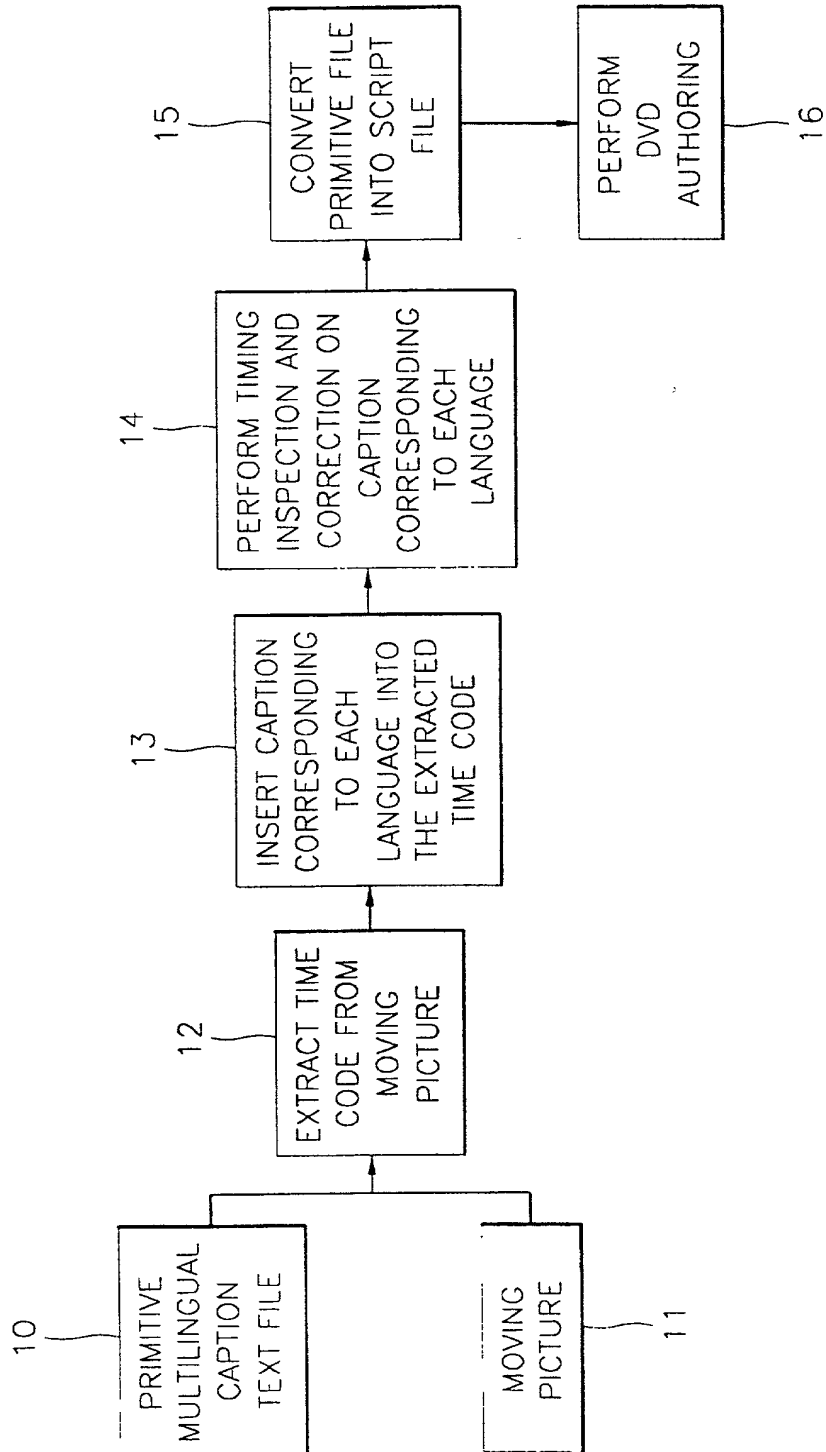
1/5

FIG. 1

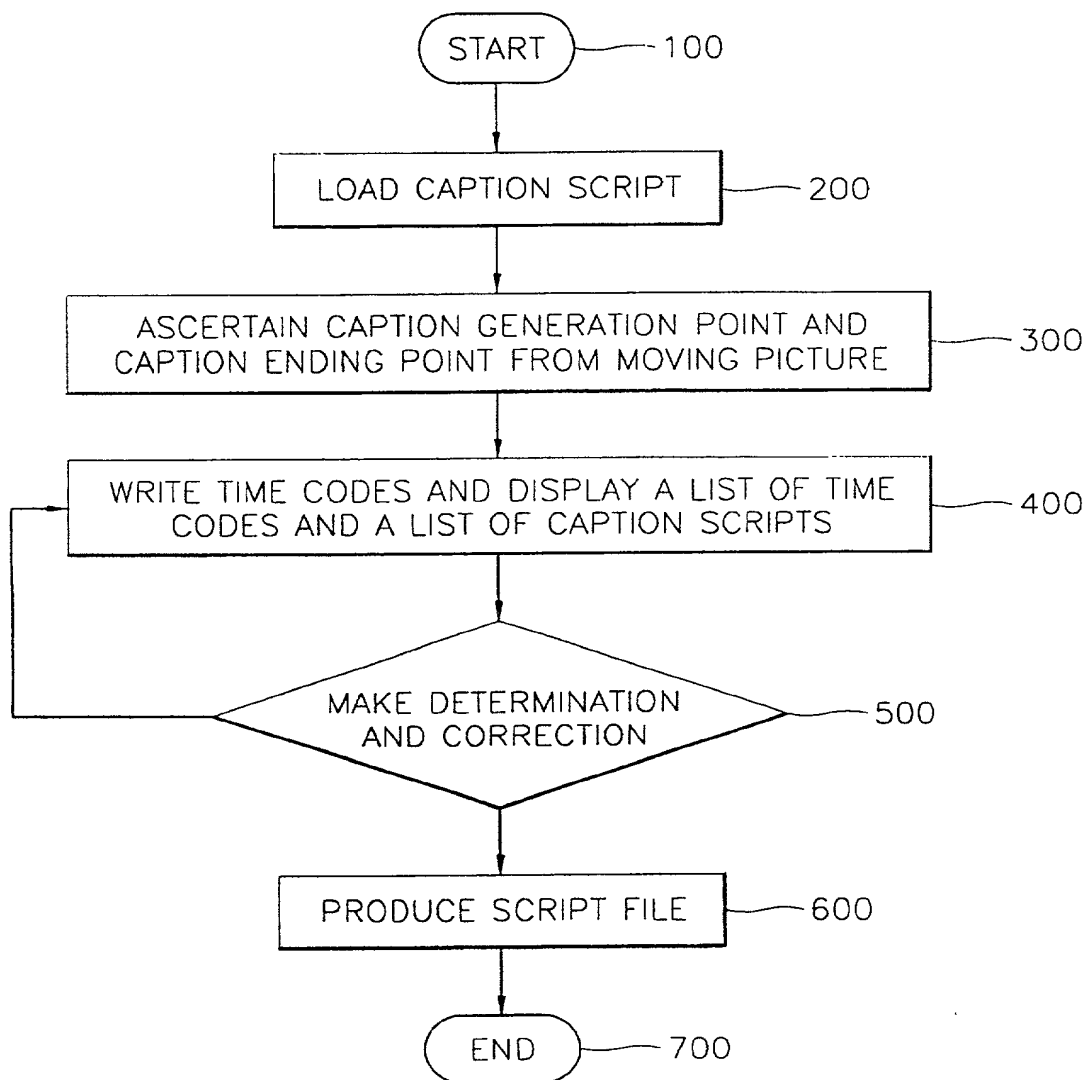


2/5

FIG. 2

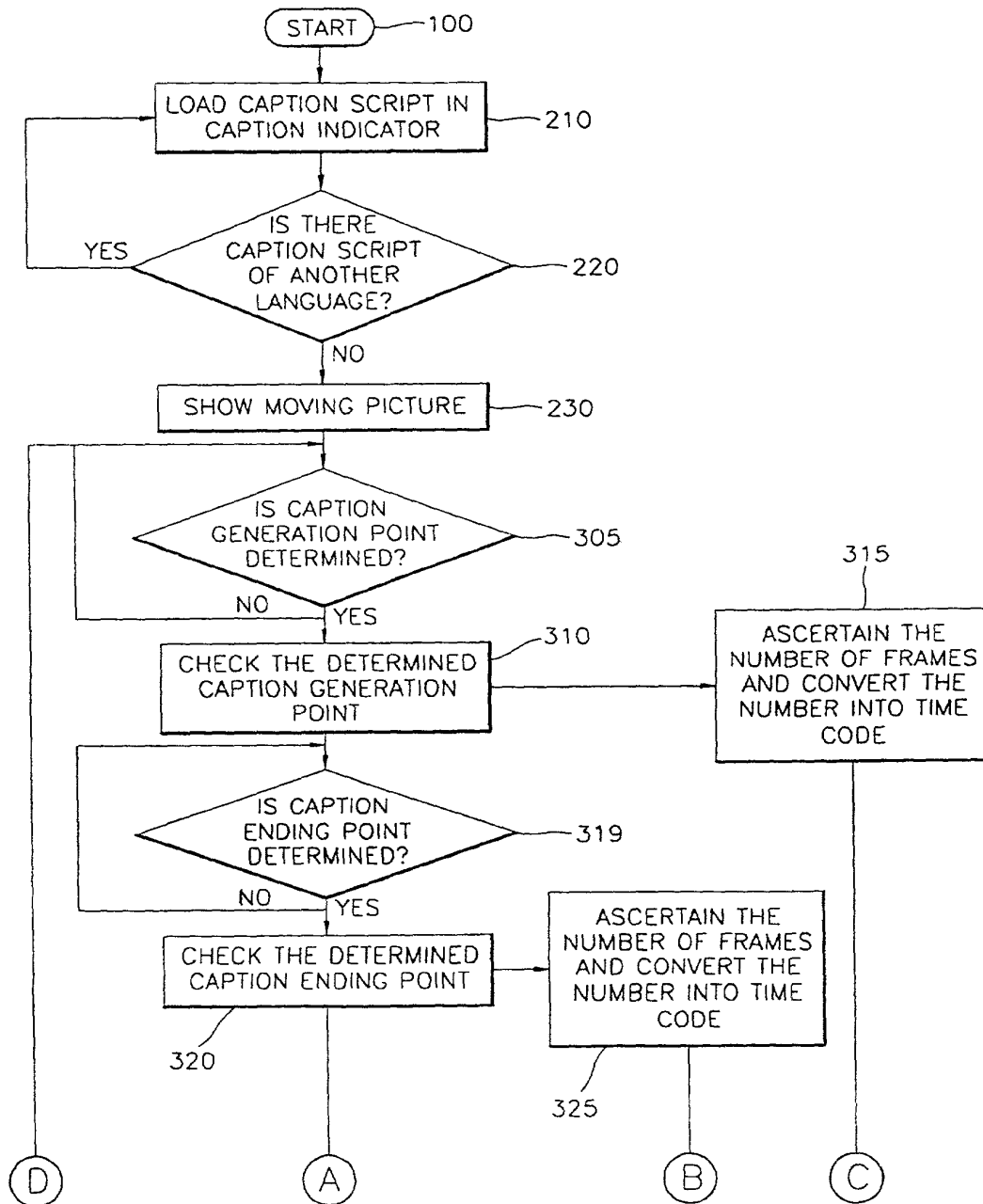


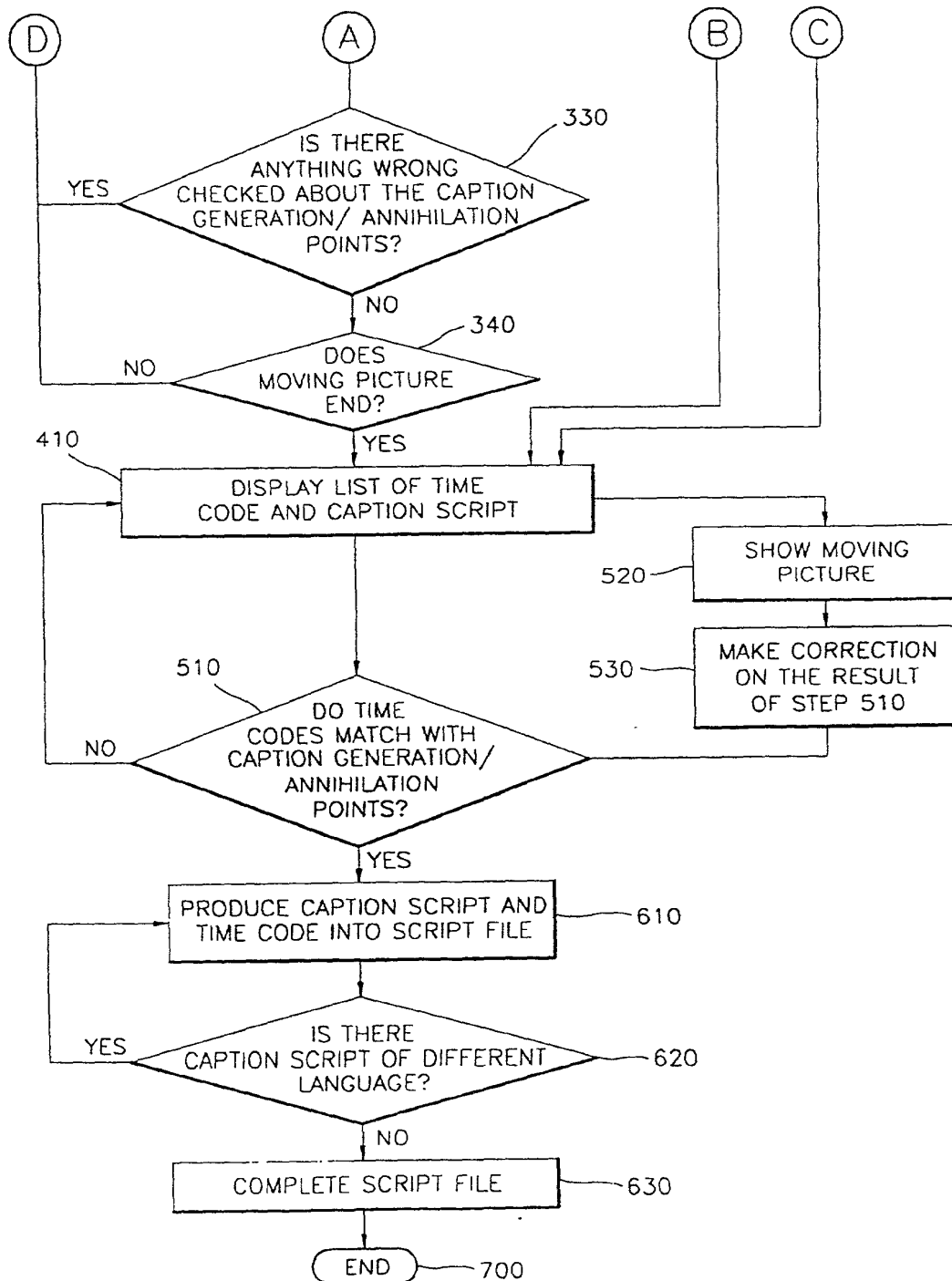
3/5  
**FIG. 3**





4/5  
FIG. 4A



5/5  
FIG. 4B

Attorney Docket No. \_\_\_\_\_

DECLARATION AND POWER OF ATTORNEY

This declaration is of the following type:

☒ [ V ] original            ☐ [ ] design            ☐ [ ] supplemental  
☐ [ ] national stage of PCT  
☐ [ ] divisional            ☐ [ ] continuation            ☐ [ ] continuation-in-part

As a below name inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name.

I believe that I am the original, first and sole inventor (*if only one name is listed below*) or an original, first, and joint inventor (*if plural names are listed below*) of the subject matter which is claimed and for which a patent is sought on the invention entitled

SUBTITLE MENAGEMENT METHOD FOR DIGITAL VIDEO DISK

the specification of which:

☒ [ v ] is attached hereto.

(Check one)

☐ [ ] was filed on \_\_\_\_\_ as Serial No. \_\_\_\_\_  
and was amended on \_\_\_\_\_  
(*if applicable*).

☐ [ ] was described and claimed in PCT International  
Application No. PCT/\_\_\_\_\_ filed  
on \_\_\_\_\_ and as amended pursuant  
to PCT Article 19 on \_\_\_\_\_ (*if any*).

I state that I have reviewed and understand the contents of the specification identified above, including the claim(s), as amended by any amendment referred to above.

I acknowledge the duty to disclose information that is material to the examination of the application identified above in accordance with 37 CFR § 1.56.

I claim foreign priority benefits pursuant to 35 USC § 119(a) of any foreign application(s) for patent or inventor's certificate or of any PCT international patent application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent, utility model, design registration, or inventor's certificate or any PCT international patent

application(s) designating at least one country other than the United States of America filed by me for the same invention and having a filing date before that of the application(s) from which the benefit of priority is claimed.

**PRIOR FOREIGN PATENT, UTILITY MODEL, AND DESIGN REGISTRATION  
APPLICATION, BENEFIT CLAIMED UNDER 35 USC § 119(a)**

Priority Claimed  
Under 35 USC § 119(a)

Rep. of Korea 1999-62986 27/December/1999 Yes V No \_\_\_\_  
(Country) (Prior Foreign (Day/Month/Year Filed)  
Application No.)

\_\_\_\_ Yes \_\_\_\_ No \_\_\_\_  
(Country) (Prior Foreign (Day/Month/Year Filed)  
Application No.)

I claim the benefit pursuant to 35 USC § 119(e) of the following United States Provisional patent application(s):

**PRIOR U.S. PROVISIONAL PATENT APPLICATIONS,  
BENEFIT CLAIMED UNDER 35 USC § 119(e)**

\_\_\_\_  
Application No. Filing Date (day,month,year)

\_\_\_\_  
Application No. Filing Date (day,month,year)

I claim the benefit pursuant to 35 USC § 120 of any United States patent application(s) or PCT international patent application(s) designating the United States of America listed below and, insofar as the subject matter of each of the claims of this patent application is not disclosed in the prior patent application(s) in the manner provided by the first paragraph of 35 USC § 112, I acknowledge the duty to disclose material information as defined in 37 CFR § 1.56 effective between the filing date of the prior patent application(s) and the national or PCT international filing date of this patent application.

**PRIOR U.S. PATENT APPLICATIONS OR PCT INTERNATIONAL PATENT  
APPLICATIONS DESIGNATING THE U.S., BENEFIT CLAIMED UNDER 35 USC § 120**

U.S. PATENT APPLICATIONS

STATUS

Application Serial No.      U.S. Filing Date      (Pat./Pend./Aban.)

Application Serial No.      Filing Date      Status (Pat./Pend./Aban.)

PCT APPLICATIONS DESIGNATING THE U.S.

STATUS

Application No.      Filing Date      U.S. Serial Nos.      (Pat./Pend./Aban.)  
Assigned (if any)

Application No.      Filing Date      U.S. Serial Nos.      (Pat./Pend./Aban.)  
Assigned (if any)

As a named inventor, I appoint the following attorneys to prosecute this application and transact all business in the Patent and Trademark Office connected with this patent application.

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I authorize my attorneys to accept and follow instructions from \_\_\_\_\_ regarding any matter related to the preparation, examination, grant, and maintenance of the patent application identified above, any continuation, continuation-in-part, or divisional patent application based on the patent application identified above, and any patent issuing from that patent application, until I or my assigns withdraw this

authorization in writing.

I declare that all statements made herein of my own knowledge are true, that all statements made on information and belief are believed to be true, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole or first inventor: Jong-won Cho

Inventor's signature

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30 November 2001

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